MIO-2260

Intel® Atom™ N455 MI/O-Ultra SBC, DDR3, 18-bit LVDS, VGA ,1 GbE, Mini PCIe, 2 USB, 2 COM, MIOe

VxWorks® Windows Embedded Linux QNX

CE FCC

Features

- Embedded Intel® Atom™ N455 Single Core + ICH8M, DDR3 memory support
- Intel Gen 3.5 DX9, MPEG2 Decode in HW, Dual Independent display: 18-bit LVDS + VGA
- Supports 12 V +/- 10% input power and DC power hot plug design
- 1 Intel GbE support, Rich I/O interface with 2 COM, 1 SATA, 2 USB 2.0, GPIO, SMBus, CF, and MIOe expansion interface
- Supports embedded software APIs and Utilities

Software APIs: GPIO, H/W Monitor, Brightness, Watchdog, Backlight On/Off, SMBus & I²C, CPU Speed, System Throttling

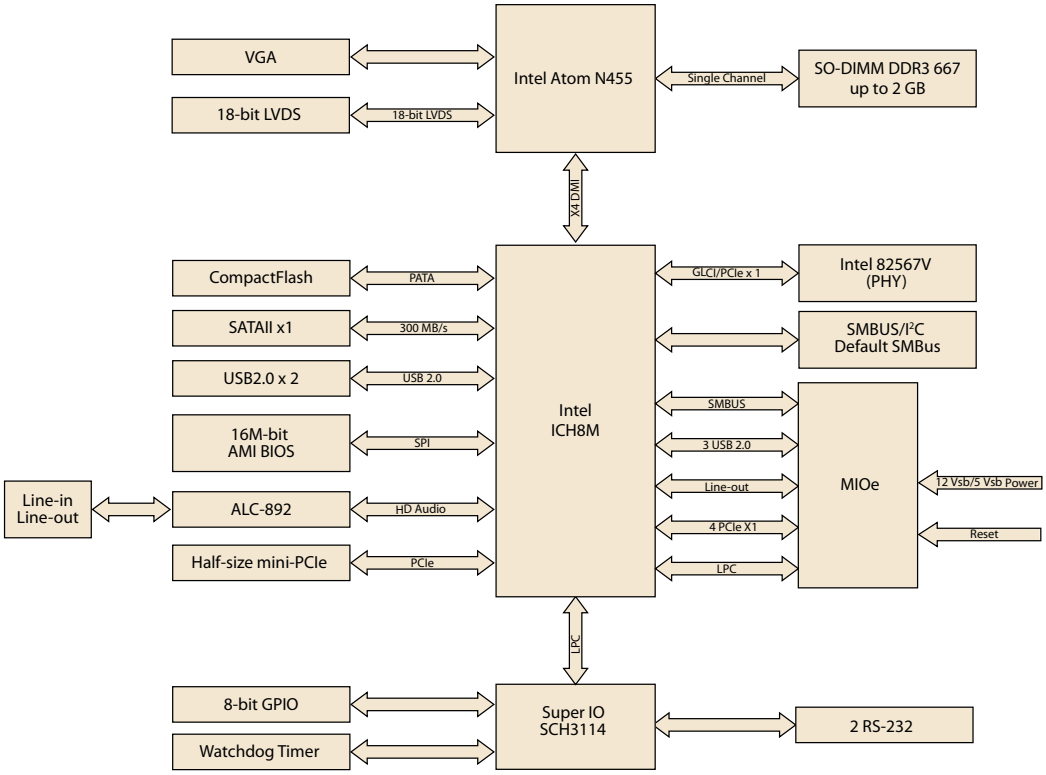
Utilities: BIOS Flash, Monitoring, eSOS, Flash Lock, Embedded Security ID

Specifications

Processor System	CPU	Intel Atom N455 Single Core 1.66 GHz Processor
	Frequency	1.66 GHz
	L2 Cache	512 KB
	System Chipset	Intel N455 + ICH8M
	BIOS	AMI 16 Mbit Flash BIOS
Memory	Technology	DDR3 667 MHz
	Max. Capacity	2 GB
	Socket	1 x 204-pin SODIMM
Display	Chipset	Intel Atom Processor N455 1.66GHz
	VRAM	Optimized Shared Memory Architecture up to 224 MB system memory
	Graphic Engine	Intel Gen 3.5 DX9, MPEG2 Decode in HW Embedded Gen3.5+ GFX Core
	LVDS	LVDS: Single channel 18-bit LVDS up to WXGA 1366 x 768
	VGA	Intel Atom N455 Single Core up to 1400 x 1050 (SXGA)
	Dual Display	VGA+LVDS
Ethernet	Speed	10/100/1000 Mbps (Supports Wake on LAN)
	Controller	ICH8M + Intel 82567V
	Connector	RJ45
Audio	Chipset	Realtek ALC892 High Definition Audio (HD), Line-in, Line out
WatchDog Timer		Output System reset, Programmable counter from 1 ~ 255 minutes/ seconds
Storage	Compact Flash	Supports CompactFlach Card TYPE II (Primary Master IDE Channel)
	SATA	1 SATA II (Max. Data Transfer Rate 300 MB/s)
Rear I/O	Serial	-
	Ethernet	1 (10/100/1000Mbps)
	VGA	1
	USB	2
	DC Power Jack	1 (support by request)
Internal I/O	Serial	2 x RS-232 (ESD protection for RS-232: Air gap ±15 kV, Contact ±8 kV)
	I²C	1 (Share SMBus pin , support by request)
	SMBUS	1
	GPIO	8-bit GPIO (5 V tolerance)
Expansion	Mini PCI Express	1 (half size)
	MIOe	1 (SMBus, 3 x USB 2.0, 4 x PCIeX1, LPC, line out, 5 Vsb/12 Vsb power)
Power	Power Type	AT (Supports DC power hot plug design)
	Power Supply Voltage	Support single 12V input (12 V +/- 10%)
	Total peripheral power supply output	5V@ 2.8A for CPU board and MI/O module totally, 12V@ 2A for MI/O module
	Power Consumption (Typical)	0.64 A, 12 V
	Power Consumption (Max, test in HCT)	0.86 A, 12 V
	Power Management	APM, ACPI
	Battery	Lithium 3 V/210 mAH
Environment	Operational	0 ~ 60° C (32 ~ 140° F) (Operational humidity: 40° C @ 95% RH, Non-Condensing)
	Non-Operational	-40° C ~ 85° C and 60° C @ 95% RH, Non-Condensing
Physical Characteristics	Dimensions (L x W)	100 x 72 mm (3.9" x 2.8")
	Total Height	33.48 mm
	Weight	0.42 kg (0.93 lb), weight of total package

All product specifications are subject to change without notice

Board Diagram



Ordering Information

Part No.	CPU	L2 Cache	LVDS	VGA	GbE	Audio	RS-232	USB 2.0	SATAII	GPIO	CF	MIOe	mini PCIe	DC power jack	Thermal Solution	Operational Temp.
MIO-2260NF-S6A1E	Intel Atom N455 1.66 GHz	512 KB	18-bit	Yes	1	Yes	2	2	1	8-bit	1	1	1 (half size)	-	Passive	0 ~ 60° C

Packing List

Part No.	Description	Quantity
	MIO-2260 SBC	
	Startup Manual	
	Utility CD	
1700006291	SATA Cable	1
1701200220	RS-232 x 2 ports 2.0 mm pitch 22 cm	1
1700019156	Audio cable 2.0 mm pitch 20 cm (line in & line out)	1
1700019656	SATA power cable 5P-1.25/5P-2.0+SATA 5P 15 cm	1
9666226000E	Screw and stud pack (1 screw for mini-PCIe, 4 M3 studs and screws for heatsink)	1
1960053175T001	Passive heatsink 99.5 x 70.5 x 15.7 mm	

Optional Accessories

Part No.	Description
1960053176T001	Heat spreader

Embedded OS/API

Embedded OS/API	Part No.	Description
Win XPE	2070010314	XPE WES2009 V4.0 24MUI
	2070010313	XPE WES2009 V4.0 ENG
WinCE	2070010331	CE6.0 R3 Pro V6.0.0 ENG (3COM)
WES 7	2070009835	Image WES7E Intel Lunar V5.0 ENG
QNX		V6.5/ 6.4/ 6.3
Vxwork		V6.8
Linux		Ubuntu V10.04
Software API		SUSI V3.0

Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

Software APIs

Control

GPIO

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus

SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

I²C

I²C is a bi-directional two wire bus that was developed by Philips for use in their televisions in the 1980s. The I²C API allows a developer to interface with an embedded system environment and transfer serial messages using the I²C protocols, allowing multiple simultaneous device control.

Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

Hardware Control

The Hardware Control API allows developers to set the PWM (Pulse Width Modulation) value to adjust fan speed or other devices; it can also be used to adjust the LCD brightness.

Display

Brightness Control

The Brightness Control API allows a developer to interface with an embedded device to easily control brightness.

Backlight

The Backlight API allows a developer to control the backlight (screen) on/off in an embedded device.

Power Saving

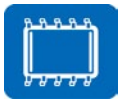
CPU Speed

Make use of Intel SpeedStep technology to reduce power power consumption. The system will automatically adjust the CPU Speed depending on system loading.

System Throttling

Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. These APIs allow the user to lower the clock from 87.5% to 12.5%.

Software Utilities



BIOS Flash

The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and API for fast implementation into customized applications.

Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easily copied! The Embedded Security ID utility provides reliable security functions for customers to secure their application data within embedded BIOS.

Monitoring

The Monitoring utility allows the customer to monitor system health, including voltage, CPU and system temperature and fan speed. These items are important to a device; if critical errors happen and are not solved immediately, permanent damage may be caused.

eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to a designated administrator. The eSOS also provides remote connection: Telnet server and FTP server, allowing the administrator to rescue the system.

Flash Lock

Flash Lock is a mechanism that binds the board and CF card (SQFlash) together. The user can "Lock" SQFlash via the Flash Lock function and "Unlock" it via BIOS while booting. A locked SQFlash cannot be read by any card reader or boot from other platforms without a BIOS with the "Unlock" feature.

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